

10/646,190

H1903

REMARKS

Claims 1-25 are currently pending in the subject application and are presently under consideration. Claims 1, 10 and 17 have been amended as shown on pp. 2-4 of the Reply. Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Drawing Objection

The drawings have been objected to under 37 CFR 1.83(a) as allegedly failing to show every feature of the claimed invention. The Examiner states that the figures fail to show that the claimed "monitoring component" monitors the shrink component but fails to indicate the analyzing of the photoresist. It should be noted that, in the figures, the monitoring component is an element of the "LER and/or standing wave mitigation system." The relationship and operation of this system 500 with respect to the photoresist 522 is clearly indicated in Fig. 5a. Therefore, contrary to the Examiner's assertion, the arrangement of the monitoring system to the photoresist is in fact clearly illustrated. Accordingly, this objection should be withdrawn.

II. Rejection of Claims 8 and 15 Under 35 U.S.C. §112

Claims 8 and 15 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. This rejection should be withdrawn for the following reasons. The claims do in fact comply with the enablement requirement.

The Examiner states that "the specification contains the full expansion of the acronyms RELACS and SAFIER (on page 9) but does not have any definitions of it. Therefore the acronyms have not been provided any patentable weight." However, it should be considered that these terms are well known terms of art that refer to lithographic products and processes. RELACS is known in the art to refer to products and processes of AZ Electronic Materials and SAFIER is known in the art to refer to products and processes of Tokyo Ohka Kogyo, Ltd. These terms would therefore be known and understood to the person skilled in the art to which the claimed invention appertains. 37 CFR 1.71(a) requires that:

10/646,190

H1903

the specification must include a written description of the invention or discovery and of the manner and process of making and using the same, and is required to be in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, or with which it is most nearly connected, to make and use the same.

The requirements of 37 CFR 1.71(a) are therefore met with the description of RELACS and SAFIER, and the claims are in fact enabled by the present specification. Accordingly, the rejection of claims 8 and 15 should be withdrawn.

III. Rejection of Claims 1-3, 6-11, 13-21 and 23-25 Under 35 U.S.C. §103(a)

Claims 1-3, 6-11, 13-21 and 23-25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Arita (US_6,905,949 B2) in view of Choo *et al.* (US_6,516,528 B1). This rejection should be withdrawn for the following reasons. Arita and Choo *et al.*, taken alone or in combination, fail to disclose or suggest each and every limitation set forth in the subject claims.

A single prior art reference anticipates a patent claim only if it *expressly or inherently describes each and every limitation set forth in the patent claim*. *Trintec Industries, Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 63 USPQ2d 1597 (Fed. Cir. 2002); *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The *identical invention must be shown in as complete detail as is contained in the ... claim*. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added).

Applicant's claimed invention relates a method and system that mitigates line edge roughness and/or standing wave(s) on pattern lines of a semiconductor device using a non-lithographic shrink component that selectively applies heat to a photoresist coating. Amended claim 1 specifically recites *a monitoring component that analyzes the photoresist and controls the application of heat by the non-lithographic shrink component so as to heat the photoresist to a point prior to melting of the photoresist to mitigate line edge roughness and/or standing wave(s) on the pattern lines while retaining*

10/646,190

H1903

a target critical dimension. Arita and Choo *et al.*, taken alone or in combination, fail to disclose or suggest these features of applicant's claimed invention.

Arita is directed to a semiconductor apparatus fabrication method capable of effectively suppressing edge roughness when an extremely fine resist pattern is formed. The Examiner cites the Abstract and also col. 3, lines 32-35 of Arita as allegedly disclosing the presently claimed "non-lithographic shrink component." Applicant's representative disagrees. These cited passages disclose that an extremely fine resist pattern is covered with a film whose heat-resistance temperature is higher than the softening temperature of the resist pattern. In this state, the resist pattern is heated at a temperature *higher than the softening temperature* of the resist pattern. This disclosure clearly teaches away from the claimed invention, in which no film layer is used, and which includes *heating the photoresist to a point prior to melting of the photoresist*.

The Examiner further proposes a combination of Arita with Choo *et al.*, who is cited for disclosing a monitoring component taken to read on the claimed invention. The Examiner states that Choo *et al.* discloses a monitoring component that analyzes and controls the application of heat to a photoresist, citing col. 9, lines 16-47. However, this passage discloses an "exposure system" that "controls an exposure time and temperature of a blanket exposure" of a developed wafer, "to ascertain the LER of the developed photoresist." However, this passage also states that the "blanket exposure has a duration and temperature which is associated with the determined LER... such that the blanket exposure reduces the LER of the photoresist." This passage also states that "the subsequent blanket exposure... is *not sufficiently intense to cause a reflow* of the resist, but does operate to alter the chemistry of the photoresist, thereby causing edges of the photoresist feature to pull back due to surface tension, which reduces the LER of the photoresist feature." In this respect, it is also clear that Choo *et al.* also teaches away from the claimed invention which recites *heating the photoresist to a point prior to melting of the photoresist*. Further, the disclosure of Choo *et al.* is at cross purposes with the disclosure of Arita who discloses melting the photoresist under the film covering. Therefore, there is no suggestion of combining these references, and any combination would result in an inoperable device. Further, such a combination could not be arrived at without a hindsight reading of the present disclosure. In any event, in view of at least the

10/646,190

H1903

foregoing comments, it is readily apparent that Arita and Choo *et al.*, taken alone or in combination, does not disclose or suggest the subject invention as recited in independent claims 1, 10 and 17 (and claims that depend therefrom).

IV. Rejection of Claims 4-5, 12 and 22 Under 35 U.S.C. §103(a)

Claims 4-5, 12 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Arita (US_6,905,949 B2) in view of Choo *et al.* (US_6,516,528 B1) and further in view of Singh *et al.* (US_6,570,157 B1). This rejection should be withdrawn for at least the following reasons. Arita, Choo *et al.* and Singh *et al.*, taken alone or in combination, do not disclose or suggest all limitations set forth in the subject claims.

It is respectfully submitted that claims 4-5, 12 and 22 are allowable for at least the same reasons as the independent claims from which they depend. Singh *et al.* fails to cure the aforementioned deficiencies of Arita combined with Choo *et al.* with respect to the independent claims from which these claims depend. Accordingly, withdrawal of this rejection is respectfully requested. Also, Singh *et al.* is commonly assigned to the present assignee. Therefore, it would be improper to rely on this reference in accordance with 35 U.S.C. 103(c). Withdrawal of the Singh *et al.* reference from consideration is respectfully requested for at least this reason.

10/646,190

H1903

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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